

REMARKS

Applicants request favorable consideration and allowance of the subject application in view of the preceding amendments and the following remarks.

Claims 1-3, 5, 10-13, 37-46, 54, and 56-64 are presented for examination.

Claims 1, 2, 10, 12, and 37 are independent. As indicated in the August 7, 2003 Office Action, claims 12, 37-46, 58, and 59 are allowed. By this paper, claims 1 and 10 have been amended to clarify features of the subject invention. Support for these changes and claims can be found in the original application, as filed. Therefore, no new matter has been added.

Initially, Applicants' representative thanks Examiner Amari for the cordial and productive interview conducted on December 22, 2003. At the interview, claims 1, 2, and 10, as well as the Foo and Shafer et al. patents were discussed; an agreement was reached that claim 2 is allowable; and proposed amendments to claims 1 and 10 were discussed. In an earnest attempt to advance prosecution, claims 1 and 10 are amended herein to incorporate the amendments discussed at the interview.

In the Office Action dated August 7, 2003, claims 1-3, 5, and 13 were rejected under 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 5,999,310 to Shafer et al. Claims 1-3, 10, and 13 were rejected under 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 5,515,207 to Foo. Claim 11 was rejected under 35 U.S.C. § 103 as being unpatentable over the Shafer et al. patent in view of U.S. Patent No. 5,623,365 to Kuba. Claims 54 and 56 were rejected under 35 U.S.C. § 103 as being unpatentable over the Shafer et al. patent in view of U.S. Patent No. 5,631,721 to Stanton et al. Claim 57 was rejected under 35 U.S.C. § 103 as being unpatentable over the Foo patent in view of the Stanton et al. patent. These rejections are respectfully traversed.

Applicants submit that the cited art fails to teach or suggest salient features of the present invention, as recited in independent claims 1, 2, and 10.

Claim 1

Claim 1 is directed to a projection optical system, and discloses, *inter alia*, first and second imaging optical systems, with a field optical system disposed therebetween. The second imaging optical system has no mirror, and in the projection optical system, a central position of a pupil is not blocked with respect to light.

According to Applicants' understanding of the Shafer et al. patent, as disclosed in Figure 4, for example, a concave reflector 124 has a central optical aperture through which light passes. Preferably, light that passes through the central optical aperture is light from an object 120 that has passed through a planar reflector 123 and a meniscus lens 125, has been reflected by the concave reflector 124, passes back through the meniscus lens 125, and is reflected by the planar reflector 123. *See, e.g.*, Fig. 4. In actuality, however, because the aperture is formed on the concave reflector 124, Applicants believe that some light from the object 120 necessarily will proceed directly through the central aperture, i.e., without following the path just described. Because of this occurrence, Applicants understand that some of the light that proceeds directly through the central aperture will impinge on the imaging plane 140 and degrade image contrast, while the rest of the light that proceeds directly through the central aperture will be blocked by an aperture stop 131, resulting in a loss of light quantity. Thus, in the Shafer et al. patent, light from a central portion of a pupil is at least partially blocked. By contrast, claim 1 recites that the central portion of a pupil is **not** blocked with respect to light.

Moreover, as discussed at the interview, Applicants believe that the Foo patent does not teach or suggest at least that the field optical system disposed between the first and second imaging optical systems has at least one third lens, as recited in claim 1.

Claim 2

Claim 2 is directed to a projection optical system and recites, among other features, that the projection optical system does not include any one of a lens, a mirror, and a diffractive optical element having a negative power. As discussed at the interview, the Schafer et al. patent discloses that a near planar or planar reflector 123, which is a reflectively coated lens element, has a negative power. Also, the Foo patent discloses that a lens group 30 has a negative power. Col. 3, ll. 56-58.

Claim 10

Claim 10 is directed to a projection optical system and recites, among other features, a first imaging optical system, a second imaging optical system, and a substantially flat mirror disposed between the first and second imaging optical systems. The projection optical system has no mirror with a power, other than a single concave mirror of the first imaging optical system. As discussed at the personal interview, the Foo patent discloses at least two concave mirrors 20a, 20c.

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For the reasons noted above, Applicants submit that the Shafer et al. and Foo patents do not teach or suggest the salient features of Applicants present invention, as recited in independent claims 1, 2, and 10.

Applicants further submit that the remaining art cited does not cure the deficiencies noted above with respect to the Shafer et al. and Foo patents. Specifically, Applicants understand the Kuba and Stanton et al. patents to be cited merely for teaching features of dependent claims.

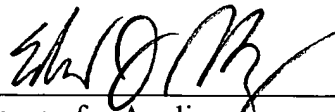
For the foregoing reasons, Applicants submit that the present invention, as recited in independent claims 1, 2, and 10, is patentably defined over the cited art.

Dependent claims 3, 5, 11, 13, 54, 56, 57, and 60-64 also should be deemed allowable, in their own right, for defining other patentable features of the present invention in addition to those recited in their respective independent claims. Further individual consideration of these dependent claims is requested.

Applicants submit that the present application is in condition for allowance. Favorable consideration and early passage to issue are respectfully requested.

Applicants' undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should be directed to our address listed below.

Respectfully submitted,



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